DOCUMENT RESUME

ED 207 407 HE 014 284

AUTHOR King, Jimmie, Jr.
TITLE An Assessment and Analysis of Selected Learning Modes Preferred by Students. Learning Theory and Applications.
PUB DATE 27 Jul 79
NOTE 50p.; Ed.D. practicum paper, Nova University.

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Black Colleges; *Classroom Techniques; *College Students; Higher Education; Institutional Research; Learning Experience; Questionnaires; *Student Attitudes; *Teaching Methods
IDENTIFIERS *Tuskegee Institute AL

ABSTRACT

Selected learning modes preferred by students at the Department of Business at Tuskegee Institute were investigated. Separate questionnaires were designed for students and faculty, each of which contained four general modal categories (environmental, pictoral, symbolic, and verbal) and subcategories. The student questionnaire allowed students to rank their preferences for each learning mode on a five-point scale, while the faculty questionnaire allowed the faculty to respond with the amount of time spent offering each modal category, also through the five-point scale method. It was found that the learning modes most often preferred by students and offered by teachers included the use of laboratory work, motion picture/television, maps, charts, diagrams, audio recordings in class, discussion, small group work, printed material, text articles, and tutorial sessions. Students were neutral in their response to games, simulations, closed circuit television, programmed texts, and other reading material. The most often preferred learning mode and the least often offered by teachers included field trips, demonstrations, and role playing. The traditional lecture method was not preferred by students but was most often offered by teachers. A literature review, a bibliography, and sample student and faculty questionnaires are presented. (SW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED207407

AN ASSESSMENT AND ANALYSIS OF SELECTED LEARNING MODES PREFERRED BY STUDENTS

LEARNING THEORY AND APPLICATIONS

by

Jimmie King, Jr.
Tuskegee Institute

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Jimmie King Jr.

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

✓ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

Dr. Dennis T. Adams
North Alabama Cluster

A PRACTICUM PRESENTED TO NOVA UNIVERSITY

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE

DEGREE OF DOCTOR OF EDUCATION

NOVA UNIVERSITY

July 27, 1979

HE 011 284

Abstract of a Learning Theory and Applications Research Proposal Presented to Nova University in Partial Fulfillment of the Requirements for the Degree of Doctor of Education

AN ASSESSMENT AND ANALYSIS OF SELECTED LEARNING MODES PREFERRED BY STUDENTS

By

Jimmie King, Jr.
July 27, 1979

Research was conducted to assess and analyze selected learning modes preferred by students and offered by teachers in the Department of Business at Tuskegee Institute. A survey questionnaire was designed to measure the preferred and offered modes of instruction. A separate questionnaire was designed for students and teachers. Each questionnaire contained four general modal categories (environmental, pictoral, symbolic, and verbal) with each category containing specific modal subcategories. The questionnaires were designed to allow the students and teachers to rank their preferences to each learning mode on a scale from one to five, with five being the highest possible rank.

The questionnaires were distributed to students during a regular class period and to the teachers in the Department of Business and supporting faculty. The responses were tabulated. Since the data gathered were on the ordinal scale, the chi-square test of independence was used to determine whether the responses on the learning modes preferred by students and offered

by teachers were independent of their ranks. In addition, Spearman's rank correlation coefficients and Kendall's Tau rank correlation coefficients were calculated to measure the degree of relationship between responses of the students' preferences and the teachers' offerings.

It was found that the learning modes most often preferred by students and offered by teachers included the use of laboratory work, motion picture/ T.V., maps, charts, diagrams, audio recordings in class, discussion, small group work, printed material, text articles, and tutorial sessions. Students were found to be neutral in their response to games, simulations, closed circuit TV, programmed textual and other reading material. However, the most often preferred by students and the least often offered by teachers included field trips, demonstrations, and role-playing (teacher/student). The traditional lecture method was not preferred by the students but was most offered by teachers.

It was recommended that another study be conducted to increase the sample size of teachers in the survey and that a comparison of the two studies be made.

TABLE OF CONTENTS

	Page
LIST OF TABLES	v
INTRODUCTION	1
BACKGROUND AND SIGNIFICANCE	2
PROCEDURES	10
ANALYSIS AND RESULTS	16
DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS	32
SUMMARY	35
REFERENCES	37
APPENDIX A - (STUDENT QUESTIONNAIRE)	38
APPENDIX B - (FACULTY QUESTIONNAIRE)	41

LIST OF TABLES

TABLE		PAGE
1	RESPONSES OF STUDENTS AND TEACHERS FOR THE FIELD TRIPS (ENVIRONMENTAL) SUB-CATEGORY	16
2	RESPONSES OF THE STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR THE DEMONSTRATION (ENVIRONMENTAL) SUB-CATEGORY	17
3	RESPONSES OF THE STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR THE ROLE PLAYING (BY TEACHER/STUDENT) SUB-CATEGORY OF ENVIRONMENTAL VARIABLE	18
4	RESPONSES OF THE STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR THE GAMES AND SIMULATIONS SUB-CATEGORY OF THE ENVIRONMENTAL VARIABLE	19
5	RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR THE LABORATORY WORK SUB-CATEGORY OF THE ENVIRONMENTAL VARIABLE	20
6	RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR THE PICTURE/SLIDE SUB-CATEGORY OF THE PICTORIAL VARIABLE	21
7	RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR THE MOTION PICTURE/TV SUB-CATEGORY OF THE PICTORIAL VARIABLE	22
8	RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR THE CLOSED CIRCUIT TELEVISION SUB-CATEGORY OF THE PICTORIAL VARIABLE	23
9	RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR MAPS, CHARTS, DIAGRAMS SUB-CATEGORY OF THE SYMBOLIC CATEGORY	24
10	RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR AUDIO RECORDINGS (IN CLASS) FOR THE VERBAL CATEGORY	25

TABLE		PAGE
11	RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR LECTURES (WITH LITTLE OR NO DISCUSSION) FOR VERBAL CATEGORY	26
12	RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR DISCUSSION (QUESTIONS POSED FOR STUDENT RESPONSES IN CLASS) FOR VERBAL CATETORY	27
13	RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR SMALL GROUP WORK (GROUP CASES, PROJECTS AND RESEARCH, RESULTS SHARED IN CLASS) FOR VERBAL CATEGORY	28
14	RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR TEXT, ARTICLES AND OTHER READING ASSIGNMENTS DONE IN CLASS AND AT HOME FOR THE VERBAL CATEGORY	29
15	RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR PROGRAMMED TEXTUAL AND OTHER READING MATERIALS WHICH HAVE QUESTIONS AND ANSWERS COMBINED FOR THE VERBAL CATEGORY	30
16	RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR TUTORIAL (TEACHER INDIVIDUALIZED INSTRUCTION IN CLASS AND OFFICE) FOR VERBAL CATEGORY	31
17	AREAS OF COMMONALITY, NEUTRALITY AND DISCREPENCIES . . .	35

INTRODUCTION

The age of technology has caused vast changes in the business world and this has necessitated changes in education, both in terms of curriculum and methods of instruction. In recent years, we have seen a shift in educational philosophy from a teacher-centered emphasis to a student-centered one. Individualized instruction has become the vogue during the seventies, and business educators are beginning to make plans which consider individual performance goals as well as occupational or career objectives. A vital part of that planning is relating methods of instruction to content and deciding on the most effective learning mode or technique for achieving the desired goals.

> Students today are less inhibited in expressing their dissatisfaction with the quality of their eeucation. They are demanding that the content of their education be made relevant to their needs, and they are demanding the rights to express their views concerning the quality of instruction they are receiving.[1]

The Department of Business at Tuskegee Institute has an "open-door" admission policy. While a large number of students admitted into the various business programs at the Institute are academically prepared for college level work, there is also a large number academically disadvantaged.

With continued concern expressed by the central administration and the business faculty for developing more means of improving instruction and the performance of our students, this study, which focused on students

---

[1]Lindsay, Vaughnie J., "Teacher Education: An Overview," National Business Education Yearbook, No. 10, p. 309.

and their needs in terms of preferences as to modes of instruction, will assist in improving the effectiveness of the instructional programs of the Department of Business. The study assessed selected learning modes preferred by business students and the frequency with which these same modes were employed by the teachers of these students. The study identified discrepancies existing between the preferred and offered learning modes inasmuch as the discrepancy might very well be a contributing factor which negatively affects the student's learning performance.

Herrscher pointed out that the national commitment to equality of higher educational opportunity and to accountability for student learning has created many complex problems, at the center of which is the need for significant modifications in traditional methods of college-level instruction. He noted that sweeping changes in instructional methodology are necessary to accommodate not only the educational aspirations, but also the fundamental and pervasive learning problems of large and growing segments of college populations which are obviously not composed of traditional college-level students. Otherwise, Herrscher said, "equal opportunity" may prove to be merely another illusion to the very students (i.e., low achieving, minority groups, socioeconomically deprived, culturally disadvantaged, handicapped) for whom it should have the greatest mearning.[2]

Background and Significance

It is important to note that Tuskegee Institute is a predominantly black institution with a student body composed primarily of minorities.

---

[2]Herrscher, Barton R., "Implementing Individualized Instruction," President, Mitchell College, Statesville, North Carolina (Mimeographed Document, February 1, 1971).

If Herrscher's contention is true, it is significant for the business faculty at Tuskegee Institute to assess and analyze its instructional program to determine which modes of learning students prefer among those offered.

This study was also significant for it undertook to verify that certain discrepancies do exist between the teaching practices of teachers and learning preferences of students. It might be that these discrepancies may be contributing factors to diminish motivation and poor learning performance of students in the Department of Business at Tuskegee Institute.

Successful teaching requires correct methodology. With an awareness of the preferences of students, teachers will be in a better position to make use of those modes of instruction or techniques that will assist the students to materially improve their level of motivation--the desire to succeed well in the learning process or problem with which they may be faced.

To avoid misinterpretation and to establish a frame of reference, the following definitions of terms as they are used in this paper are given:

Learning: Learning is a process by which an activity originates or is changed through reacting to an encountered situation, provided that the characteristics of the change in activity cannot be explained on the basis of native response tendencies, maturation, or temporary states of the organism (e.g., fatigue, drugs, etc.).[3]

---

[3]Snellbecker, Glen E., Learning Theory, Instructional Theory and Psychoeducational Design, McGraw-Hill Book Company, New York, 1974; p. 12.

Teaching: Broadly, the act of providing activities, materials, and guidance that facilitate learning, in either formal or informal situations.[4]

Mode: A possible, customary, or preferred way of doing something: STYLE.[5]

Learning is a continuous and a very personal process. Teaching is partially a viewpoint toward learning. Teaching encompasses all factors in the learning process and attempts to guide and control those factors to provide a learning situation which will provide maximum effectiveness and efficiency. In order to do this, the teacher must have a storehouse of a variety of teaching methods, techniques, modes, etc., to utilize in order to best meet the needs and interests of the learner. This study is appropriate for the module on Learning Theory and Applications for it assesses selected learning modes preferred by students and offered by teachers.

Snellbecker points out that . . . all definitions of learning include the term "change." This "change" is usually meant to include the acquisition or modification of some behavior and must be at least permanent enough to be noticeable by some observer.[6]

The teacher is the "change agent" in the teaching-learning process. The teacher must be one who (1) is sympathetic to the needs and interests

---

[4]Good, Carter V., Dictionary of Education, McGraw-Hill Book Company, New York, 1959, 0. 553.

[5]Webster, A. Merriam, Webster's New Collegiate Dictionary, G & C Merriam Company, Springfield, Massachusetts, 1976, p. 739.

[6]Snellbecker, Op. Cit., p. 14.

of students, (2) has a complete knowledge and understanding of the students involved, (3) is well versed in educational psychology and factors influencing learning, and (4) one who has the maturity of judgment and control to arrive at and implement wise decisions affecting the learning process. This study focused on the preferences of students in regards to learning modes offered by teachers of business students at Tuskegee Institute. By assessing these preferences, these teachers will have a better insight into a better understanding of how best to motivate and to meet the needs of the students. Ripple noted that new knowledge about the human being as an individual and as a learner is being brought to light every year through continued research. This is why the successful teacher continues throughout his teaching career to seek for new and better means of facilitating more effectively the teaching-learning process.[7]

It is an important part of the folklore of college teaching that certain methods of instruction are preferred over others. The most preferred methods probably vary by discipline as well as the temperament of the professor. Just as important as having preferences is the supporting belief or belief-system that alleges superiority for the preferred teaching method.[8]

Although it is the preferred method of the professor more often emphasized and utilized, an important point to remember is that if effective

---

[7]Ripple, R. E., Notes taken from a lecture given to the North Alabama Cluster.

[8]Dubin, Robert, Taveggia, Thomas C., The Teaching-Learning Paradox: A Comparative Study of College Teaching Methods, Center for the Advanced Study of Educational Administration, University of Oregon, Eugene, Oregon, 1963, p. 1.

learning is to take place a teaching method or mode that is student-centered and geared toward student preferences must be considered.

"The superior teacher will assess his own capabilities and will use the method that suits him best as well as that which suits his students best. He will study and plan carefully the methods he will use in a particular situation and will quickly shift or change his procedure if he finds that it is not working. In these ways teaching methodology can be utilized to its greatest effectiveness."[9]

Gibbs asked, "If students prefer certain modes of learning over others, why do community college instructors resist adopting modes of learning preferred by students?"[10] This question, he contends, is especially relevant to use of the newer technologies in learning. It is sometimes true that while college teachers obtain sound subject-matter training in college courses, they oftentime obtain little, if any, training in the methodology of training and are therefore resistant to any learning mode which would be new to them. Many teachers perceive their function as being a "dispenser of knowledge." This viewpoint does not allow for variations in teaching styles or the introduction of the newer technologies into the learning environment.

> The lecture or "telling method" is the most widely used method of teaching in colleges and universities today. The popularity of this method probably derives from the need to handle increasing enrollments in institutions of higher learning,

---

[9]Douglas, Lloyd, Blanford, James T., Teaching Business Subjects, Prentice Hall, Inc., 1958, p. 112.

[10]Gibbs, Richard H., "An Assessment and Analysis of Selected Learning Modes Preferred by Students and Offered by Teachers (ERIC)", Document Reproduction Service No. ED112, 1970, p. 4.

although it is also tied to the belief that the fundamental goal of an instructor is to transmit knowledge.

> The lecture method assumes superior knowledge of the lecturer and therefore places in his hands the selection of subject matter and the depth of coverage of the subject matter, the balance between content and illustration, the length of the lecture period, and the frequency of the lectures in a given time period. The principal emphasis in lecture classes is on the instructional activities of the teacher, not on the activities of the student.[11]

In discussing teacher resistance to new learning technology, Gibbs reports from a study conducted by Leslie Purdy, "Community College Instructors and The Use of New Media: Why Some Do and Others Don't."

> Purdy holds to the view that the institutional atmosphere has great influence on faculty response to the introduction of innovations. He feels that we should look at institutional supports for or constraints on changed practices of learning and instruction. Reaction to newer modalities may differ according to a teacher's age, his discipline or personal values.[12]

The dominance of a particular teaching method might be attributed to the persistence of traditions about teaching. Traditions change slowly. As reported earlier, the lecture method is perhaps the most popular and widely used method of instruction at the college level. With the lecture method, the teacher is in control. It is not uncommon for teachers to fear losing this control. Norman Ward Wilson, in his report, "Newer Media Education--Problem Solver or Problem Maker," states that now that push-button education with its multimedia approaches, information retrieval systems, and environmental learning centers, today's teacher will not lose his job, will not give up control of his classes, and should not be

---

[11] Dubin, Op. Cit., p. 28.

[12] Gibbs, Op. Cit.

afraid. He states further that simply because the teacher now has television, video tape recorders, and cameras in his room, does not mean he loses control. He is still the one who decides what tape, film, or slide presentation will be used. It is still the teacher who is responsible for the learning that takes place within the confines of his classroom.[13]

Skinner points out that certain traditional ways of characterizing learning and teaching appear to be not so wrong as incomplete in the sense that they do not fully describe the contingencies of reinforcement under which behavior changes. He advances three theories: (1) We learn by doing, (2) We learn from experience, and (3) We learn by trial and error. The use of teaching machines as a technology of teaching, Skinner states:

> There is a simple job to be done. The task can be stated in concrete terms. The necessary techniques are known. The equipment needed can easily be provided. Nothing stands in the way but cultural inertia. But what is more characteristic of the modern temper than are unwillingness to accept the traditional as inevitable? We are on the threshhold of an exciting and revolutionary period in which scientific study of man will be put to work in man's best interests. Education must play its part. It must accept the fact that a sweeping revision of educational practices is possible and inevitable. When it has done this, we may look forward with confidence to a school system which is aware of the nature of its tasks, secure in its methods, and generously supported by the informed and effective citizens whom education itself will create.[14]

College and university professors should be encouraged to innovate and to experiment with the use of newer learning modes of instruction. The appropriateness of the method as well as the preference of students

---

[13]Wilson, Norman Ward, "Newer Media Education--Problem-Solver or Problem Maker," Clearing House, Vol. 43, September, 1968-May, 1969, p. 16.

[14]Skinner, B. F., The Technology of Teaching, Appleton-Century-Crofts; New York, 1968, pp. 28-29.

should be given prime consideration. It is the responsibility of the faculty to introduce and implement new instructional methods and programs. Oftentimes this is delayed, hindered, or even prevented not so much by the teacher being comfortable with the traditional approaches, but by budgetary constraints. Jones, in the article, "Fiscal Strategies to Stimulate Instructional Innovation," states that the mechanisms utilized by state decision makers to finance public higher education may also be observed to affect the degree and rate of instructional experimentation in public colleges and universities.[15] Jones contends that society is served by a higher education establishment that provides instruction which students prefer. He admits that critics of the "social demand model" assert that meeting student preferences is sometimes very costly and therefore, limits must be set beyond which society should be unwilling to support full public fiscal support in response to student demand. He makes the point that in many instances, innovative instructional programs designed to respond to student needs and preferences will not survive unless they are specifically funded by the state and are integrated somehow into institutional budget bases. Jones discusses three fiscal strategies which might be used by decision-makers to stimulate instructional innovation.

The first of these he terms "Program Change Strategy." This strategy would utilize the state budget and administrative guidelines to require institutional reallocation of funds from existing programs to new programs designed to increase instructional quality and/or breadth. The second

---

[15] Jones, Larry E., "Fiscal Strategies to Stimulate Instructional Innovation and Change," Journal of Higher Education, Vol. 49, November/December, 1978, p. 593.

approach would require exertion of state budgetary and administrative control over salary appropriations in the annual state budget and in salary-related legislation to place ceilings on institutional salary ranges. Jones calls this approach the "Salary Limitation Strategy." The third alternative to increase instruction innovation through state action, according to Jones, would provide state funding on the basis of new student enrollments, funding these marginal enrollments at an equal rate for all public segments operating in the state. This "Enrollment Market Strategy" is referred to as equi-marginal enrollment funding. Jones argues that institutions of higher education are unresponsive, inefficient, and backwards in the "industry of education" because consumers (students) do not buy, producers (institutions) do not sell, and the suppliers of resources (the tax-paying public) have little influence over the production process.

During the past decade we have experienced greater student participation in the academic process. The sovereignty of the professor has been based on the assumption that he was in the best position to decide what procedures, policies, actions, and methodologies that would maximize the educational or learning process. This assumption is now being questioned in large measure by the students.

Procedures

This research design required the development of an instrument which would measure the preferred and offered modes of instruction in the Department of Business at Tuskegee Institute. A survey questionnaire was designed

patterned after the modal categories described by Herrscher[16] (with minor modifications). A separate instrument was designed for students and faculty. Each questionnaire contained four general modal categories (environmental, pictoral, symbolic, and verbal) with each category containing specific modal sub-categories. The student questionnaire was designed to allow the students to rank their preference to each learning mode on a scale of one to five, with five being the highest possible rank.

The faculty questionnaire was a variation of the instrument designed for the students. It was designed to allow the faculty to respond with the amount of time spent on the offering of each modal category. A scale of one to five was also used with this instrument. The student questionnaire is attached as Appendix A and the faculty questionnaire is attached as Appendix B.

Classes in the Department of Business are scheduledon Monday, Wednesday, Friday for a fifty minute time span or on Tuesday and Thursday for one hour and fifty minutes. The Monday, Wednesday, Friday schedule provides for more classes and embraces all student classifications--freshman, sophomore, junior and senior. For this reason, the student population for this study was selected from the students who follow this schedule.

Efforts were undertaken to secure 100% participation on the part of the full-time teaching faculty in the completion of the faculty questionnaire.

---

[16]Herrscher, Op. Cit.

The questionnaire for students was distributed during a regular class period by the instructor of the class. Students were given an opportunity to raise questions for purposes of clarification. Upon completion by the student, the questionnaires were collected by the instructor and returned to this surveyer for processing.

Assistance in the design of the instruments was solicted from faculty and students in the Department of Business, the staff of the Division of Behavioral Science Research, a professor of statistics, and the staff of the Computer Center--all of Tuskegee Institute.

The Null Hypothesis

In order to test the hypotheses, the following null hypotheses are given:

1. There is no significant difference between the responses of the teaching practices of the teachers and learning preferences of the students.
2. There is no significant correlation between the responses of the teaching practices of the teachers and learning practices of the students.

METHOD OF ANALYSIS

The data involved the responses of the teaching practices of the teachers and the responses of the learning preferences of the students. A frequency distribution table of these responses is presented for each modal category and sub-category.

LEVEL OF SIGNIFICANCE

The chi-square test was used to determine the level of significance. The 5 percent (.05) alpha level of significance was used as the standard for rejection.

The responses of the teaching practices of the teachers and the responses of the learning preferences of the students are tabulated for each item on the questionnaire (modal categories and sub-categories). Since the chi-square test of significance is used for each of the sixteen items on

the questionnaire, the general methodology is first presented here, then each modal sub-category is analyzed and conclusions are given. Also, since the measurements are on an ordinal scale, the Spearman's rank correlation coefficient and the Kendall's Tau rank correlation coefficients are calculated to give further insight for each modal sub-category.

Correction factor for tied ranks has been included for calculating the Spearman's rank correlation and Kendall's Tau rank correlation coefficient.

1. The Null Hypothesis

   The null hypothesis (H_0) is that the responses of the teaching practices of the teachers and the responses of the learning preferences of the students in the Department of Business at Tuskegee Institute are independent for each modal sub-category.

2. The alternative hypothesis (H_1) is that the responses of the teaching practices of the teachers and learning preferences of the students are dependent (i.e., related) and such modal sub-categories are the areas of commonality.

3. The desired level of significance is $\alpha = .05$ (Alpha level).

4. The degrees of freedom are:

   $$df = (r - 1)(c - 1) = (2 - 1)(5 - 1) = 5.1 = 5$$

   where r = number of rows and c = number of columns in a contingency table.

5. The critical chi-square value -

   By referring to a table of critical χ^2 - value, it is found that for 5 degrees of freedom, the critical χ^2 - value at $\alpha = .05$ is 11.070. Therefore, reject H_0 if $\chi^2 > 11.070$.

6. Use chi-square test of independence for 2 x 6 contingency table, which is defined as

$$\chi^2 \quad \Sigma_{i=1}^{2} \Sigma_{j=1}^{6} \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

Where O_{ij} = Observed frequency in the (i,j)th cell

E_{ij} = Expected frequency in the (i,j)th cell

$$= \frac{R_i \, C_j}{N}$$

R_i = i^{th} raw total

C_j = j^{th} column total

and N = total of all frequencies

The detailed calculations are illustrated for the first item on the questionnaire.

ANALYSIS AND RESULTS

Table 1

RESPONSES OF STUDENTS AND TEACHERS FOR THE FIELD TRIPS (ENVIRONMENTAL) SUB-CATEGORY

(1 signifies low, 5 signifies high and 6 do not know (DK))

Responses	Low 1	2	3	4	High 5	DK 6	Total
Preferred by Students	35.0	15.9	24.6	27.8	39.7	12	
	24	7	24	35	50	15	155
	(15.5%)	4.5%	15.5%	22.5%	32.3%	9.7%	
Offered by Teachers	9.0	4.1	6.4	7.2	10.3	3.0	
	20	13	7	0	0	0	40
	50%	32%	17%	0%	0%	0%	
Total	44	20	31	35	50	15	195

Here O_{11} = Observed frequency in the cell (1,1 is 24

and $E_{11} = \frac{R_1 \times C_1}{N} = \frac{155 \times 44}{195} = 35.0$

Expected frequencies are given in the upper right hand corner in each cell.

Therefore, the calculated value of chi-square is equal to

$$\chi^2 = \frac{(24-35)^2}{35} + \frac{(7-15.9)^2}{15.9} + \frac{(24-24.6)^2}{24.6} + \frac{(35-27.8)^2}{27.8} + \frac{(50-39.7)^2}{39.7}$$

$$+ \frac{(15-12)^2}{12} + \frac{(20-9)^2}{9} + \frac{(13-4.1)^2}{4.1} + \frac{(7-6.4)^2}{6.4} + \frac{(0-7.2)^2}{7.2}$$

$$+ \frac{(0-10.3)^2}{10.3} + \frac{(0-3)^2}{3} = 66.95$$

Therefore, the calculated value of the chi-square statistic is

$\chi^2 = 66.95$

Since the calculated value of χ^2 is much larger than tabulated value of χ^2 (11.070), the null hypothesis of independence of responses on the students' preferences and teachers' offerings is rejected.

Furthermore the calculated value of Kendall's Tau rank correlation coefficient = -.231 and Spearman's rank correlation coefficient = -.357. This suggests that the responses on field trips preferred by students and offered by faculty are negatively correlated. It appears from the examination of the table that the students prefer more field trips as a selected learning mode and that this mode is not frequently offered by teachers.

Table 2

RESPONSES OF THE STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR THE DEMONSTRATION (ENVIRONMENTAL) SUB-CATEGORY

Responses	Low 1	2	3	4	High 5	DK 6
Preferred by Students	8	7	25	37	68	10
	5.2%	4.5%	16.1%	23.9%	43.9%	6.4%
Offered by Teachers	5	8	21	3	3	0
	12%	20%	52%	7%	7%	0%

Calculated value of $\chi^2 = 48.59$.

Kendall's Tau rank correlation coefficient = -.207

Spearman's rank correlation coefficient = -.329

Again, the hypothesis of independence of responses on the students' preferences and teachers' offerings for the demonstration variable is rejected. Moreover, the responses are negatively correlated implying that the students prefer the demonstration techniques more than those offered by their teachers.

Table 3

RESPONSES OF THE STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR THE ROLE PLAYING (BY TEACHER/STUDENT) SUB-CATEGORY OF ENVIRONMENTAL VARIABLE

Responses	1	2	3	4	5	6
Preferred by Students	7	16	44	41	37	10
	4.5%	10.3%	28.4%	26.4%	23.9%	6.5%
Offered by Teachers	17	12	11	0	0	0
	42.5%	30%	27.5%	0%	0%	0%

Calculated value of $\chi^2 = 68.56$

Kendall's Tau rank correlation coefficient = -0.075

Spearman's rank correlation coefficient = -.314

The hypothesis of independence of the responses of the students' preference and teachers' offering is rejected. Moreover, the responses are negatively correlated. This, in conjunction with the visual inspection of Table 3 suggests that the students would prefer more role playing (student/teacher) than offered by their teachers.

Table 4

RESPONSES OF THE STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR THE GAMES AND SIMULATIONS SUB-CATEGORY OF THE ENVIRONMENTAL VARIABLE

Responses	1	2	3	4	5	6
Preferred by Students	18	28	30	41	27	11
	11.6%	18.1%	19.4%	28.4%	17.4%	7.1%
Offered by Teachers	15	12	10	3	0	0
	37.5%	30.0%	25%	7.5%	0%	0%

Calculated value of $\chi^2 = 30.16$

Kendall's Tau rank correlation coefficient = .069

Spearman's rank correlation coefficient = .157

The hypothesis of independence of responses on students' preference and teachers' offering for the games and simulations sub-category is rejected. Also, a very low rank correlation coefficient is observed. This suggests that inspite of dependence of responses on students' preferences and teachers' offerings, they are not highly correlated and students do not seem to favor what teachers have to offer related to games and simulations.

Table 5

RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR THE LABORATORY WORK SUB-CATEGORY OF THE ENVIRONMENTAL VARIABLE

Responses	1	2	3	4	5	6
Preferred by Students	17	18	36	32	41	11
	11%	11.6%	23.2%	20.6%	26.5%	7.1%
Offered by Teachers	11	3	5	18	3	0
	27.5%	7.5%	12.5%	45%	7.5%	0%

Calculated value of $\chi^2 = 23.54$

Kendall's Tau rank correlation coefficient = .207

Spearman's rank correlation coefficient = .243

The hypothesis of independence of the responses on students' preference and teachers' offering for the laboratory work sub-category is rejected. There is a small positive correlation between the students' preferences and teachers' offerings suggesting that the laboratory work sub-category is more or less an area of commonality in the learning modes preferred by students and offered by teachers of students in the Department of Business at Tuskegee Institute.

Table 6

RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR THE PICTURE/SLIDE SUB-CATEGORY OF THE PICTORIAL VARIABLE

Responses	1	2	3	4	5	6
Preferred by Students	29	12	42	29	31	12
	18.7%	7.7%	27.1%	18.7%	20%	7.8%
Offered by Teachers	12	10	10	8	0	0
	30%	25%	25%	20%	0%	0%

Calculated value of $\chi^2 = 21.49$

Kendall's Tau rank correlation coefficient = .077

Spearman's rank correlation coefficient = .143

The hypothesis of independence of the responses on students' preferences and teachers' offerings is rejected. Also, a very low rank correlation coefficient is observed. This suggests that the degree of dependence of the responses on students' preference/teachers' offering is low and therefore students do not appear to be enthusiastic about picture/slide presentations.

Table 7

RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR THE MOTION PICTURE/TV SUB-CATEGORY OF THE PICTORIAL VARIABLE

Responses	1	2	3	4	5	6
Preferred by Students	36	14	26	34	35	10
	23.2%	9%	16.8%	21.9%	22.6%	6.5%
Offered by Teachers	40	0	0	0	0	0
	100%	0%	0%	0%	0%	0%

Calculated value of $\chi^2 = 78.79$

Kendall's Tau rank correlation coefficient = 0.932

Spearman's rank correlation coefficient = .714

The hypothesis of independence of the responses on the students' preference and teachers' offering for the motion picture/TV sub-category is rejected. Also, there is a very high degree of correlation between students' preferences and teachers' offerings. Therefore, it can be concluded that the motion picture/TV sub-category of the pictorial variable is an area of commonality in the learning modes preferred by students and offered by teachers. The visual inspection of the data reveals that this commonality is the low preference by the students and low offering by the teachers of the motion picture/TV modes.

Table 8

RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR THE CLOSED CIRCUIT TELEVISION SUB-CATEGORY OF THE PICTORIAL VARIABLE

Responses	1	2	3	4	5	6
Preferred by Students	34	13	24	28	45	11
	21.9%	8.4%	15.5%	18.1%	29%	7.1%
Offered by Teachers	36	0	4	0	0	0
	90%	0%	10%	0%	0%	0%

Calculated value of chi-square = 66.73

Kendall's Tau rank correlation coefficient = .755

Spearman's rank correlation coefficient = .371

The hypothesis of independence of the responses on the students' prefence and teachers' offering for the closed circuit television sub-category is rejected. There is a moderate Spearman's rank correlation coefficient. Students seem to prefer watching the closed circuit television as a learning mode; however, teachers have rarely offered it.

Table 9

RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR MAPS, CHARTS, DIAGRAMS SUB-CATEGORY OF THE SYMBOLIC CATEGORY

Responses	1	2	3	4	5	6
Preferred by Students	19	15	46	35	30	10
	12.3%	9.7%	29.7%	22.6%	19.3%	6.5%
Offered by Teachers	0	6	15	15	4	0
	0%	15%	37.5%	37.5%	10%	0%

Calculated value of $\chi^2 = 13.29$

Kendall's Tau rank correlation coefficient = .788

Spearman's rank correlation coefficient = .771

The hypothesis of independence of responses on the students' preferences and teachers' offerings is rejected. There is a high degree of correlation between the students' preference and teachers' offering indicating that this is an area of commonality in the learning preferred by students and offered by their teachers.

Table 10

RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR AUDIO RECORDINGS (IN CLASS) FOR THE VERBAL CATEGORY

Responses	1	2	3	4	5	6
Students' Preference	26	28	40	31	20	10
	16.8%	18.1%	25.8%	20%	12.9%	6.4%
Teachers' Offerings	9	5	15	9	2	0
	22.5%	12.5%	37.5%	22.5%	5%	0%

Calculated value of $\chi^2 = 7.14$

Kendall's Tau correlation coefficient = .897

Spearman's rank correlation coefficient = .900

Since the calculated value of χ^2 (7.14) is less than the tabulated value of χ^2 (11.07) at 5% level of significance, the hypothesis of independence of the responses on the students' preference and teachers' offerings for audio recordings in class is accepted. Students prefer audio recordings (in class) independently of teachers' offerings. Also, a high degree of correlation between students' preference and teachers' offering indicates that this is an area of commonality in the learning modes preferred by students and offered by teachers.

Table 11

RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR LECTURES (WITH LITTLE OR NO DISCUSSION) FOR VERBAL CATEGORY

Responses	1	2	3	4	5	6
Preferred by Students	50	30	41	14	15	5
	32.3%	19.3%	26.5%	9%	9.7%	3.2%
Offered by Teachers	0	0	21	16	3	0
	0%	0%	52.5%	40%	7.5%	0%

Calculated value of $\chi^2 = 48.7$

Kendall's Tau rank correlation coefficient = .224

Spearman's rank correlation coefficient = .086

The hypothesis of independence of the responses on students' preferences and teachers' offering is rejected. Also, there is a very low correlation coefficient between this learning mode preferred by students and offered by teachers. Interesting enough, there are 32.3% students in this survey who do not prefer lectures with little or no discussion.

Table 12

RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR DISCUSSION (QUESTIONS POSED FOR STUDENT RESPONSES IN CLASS) FOR VERBAL CATEGORY

Responses	1	2	3	4	5	6
Preferred by Students	13	13	32	42	52	3
	8.4%	8.4%	20.6%	27.1%	33.5%	2.0%
Offered by Teachers	0	0	0	11	29	0
	0%	0%	0%	27.5%	72.5%	0%

Calculated value of $\chi^2 = 27.35$

Kendall's Tau rank correlation coefficient = 0.936

Spearman's rank correlation coefficient = .871

The hypothesis of independence of the responses on the students' preferences and teachers' offerings is rejected. A very high correlation coefficient between this learning mode preferred by students and offered by teachers is observed. Therefore, this is another area of commonality in the learning modes preferred by students and offered by teachers. Teachers are very eager to pose questions and students prefer questions to be posed for their responses in the class.

Table 13

RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR SMALL GROUP WORK (GROUP CASES, PROJECTS AND RESEARCH, RESULTS SHARED IN CLASS) FOR VERBAL CATEGORY

Responses	1	2	3	4	5	6
Preferred by Students	16	23	26	36	49	5
	10.3%	14.8%	16.8%	23.2%	31.6%	3.3%
Offered by Teachers	4	8	12	12	4	0
	10%	20%	30%	30%	10%	0%

Calculated value of χ^2 = 10.73

Kendall's Tau rank correlation coefficient = .645

Spearman's rank correlation coefficient = .543

Since the calculated value of χ^2 (10.73) is less than the tabulated value of χ^2 (11.07) at 5% level of significance, the hypothesis of independence of responses on the students' preference and teachers' offerings is accepted. There is a moderate relationship between students' preferences and teachers' offerings indicating that the small group work is another area of commonality in the learning modes preferred by students and offered by teachers.

Table 14

RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR TEXT, ARTICLES AND OTHER READING ASSIGNMENTS DONE IN CLASS AND AT HOME FOR THE VERBAL CATEGORY

Responses	1	2	3	4	5	6
Preferred by Students	19	16	38	47	31	4
	12.3%	10.3%	24.5%	30.3%	20%	2.6%
Offered by Teachers	0	0	5	8	27	0
	0%	0%	12.5%	20.0%	67.5%	0%

Calculated value of $\chi^2 = 37.46$

Kendall's Tau rank correlation coefficient = .820

Spearman's rank correlation coefficient = .771

The hypothesis of the independence of the responses on the students' preferences and teachers' offerings is rejected. There is a high correlation between students' preferences and teachers' offerings indicating that there is a commonality in the learning modes preferred by students and offered by teachers for this sub-category.

Table 15

RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR PROGRAMMED TEXTUAL AND OTHER READING MATERIALS WHICH HAVE QUESTIONS AND ANSWERS COMBINED FOR THE VERBAL CATEGORY

Responses	1	2	3	4	5	6
Preferred by Students	8	16	44	39	39	9
	5.1%	10.3%	28.4%	25.2%	25.2%	5.8%
Offered by Teachers	0	17	11	12	0	0
	0%	42.5%	27.5%	30%	0%	0%

Calculated value of $\chi^2 = 21.28$

Kendall's Tau rank correlation coefficient = .386

Spearman's rank correlation coefficient = .414

The hypothesis of independence of the responses of students' preferences and teachers' offerings is rejected. There is a moderate degree of relationship between students' preference and teachers' offerings for the programmed textual and other reading material which have questions and answers combined. It appears that the students have a very high preference for such reading material whereas teachers offered it infrequently.

Table 16

RESPONSES OF STUDENTS' PREFERENCES AND TEACHERS' OFFERINGS FOR TUTORIAL (TEACHER INDIVIDUALIZED INSTRUCTION IN CLASS AND OFFICE) FOR VERBAL CATEGORY

Responses	1	2	3	4	5	6
Preferred by Students	6	8	25	33	72	11
	3.9%	5.2%	16.1%	21.2%	46.6%	7.0%
Offered by Teachers	0	0	6	22	12	0
	0%	0%	15%	55%	30%	0%

Calculated value of $\chi^2 = 21.28$

Kendall's Tau rank correlation coefficient = .969

Spearman's rank correlation coefficient = .886

The hypothesis of independence of the responses of students' preferences and teachers' offerings is rejected. The responses depend on whether the respondee is a student or teacher. A high degree of correlation is observed between students' preferences and teachers' offerings indicating that tutorial help in class and in office is popular with both the teachers and students. This is another commonality in the learning modes preferred by students and offered by teachers.

DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

It was observed that great variation existed between the responses of the learning modes preferred by students and those offered by teachers of students in the Department of Business at Tuskegee Institute. There were only two modal sub-categories, namely: audio recordings in class and small group work (group projects, case studies and analysis) where the responses were statistically independent of whether the respondent was a student or a teacher. In all other modal sub-categories, the responses were highly dependent on the students' preferences and teachers' offerings. Therefore, significant differences existed between the responses of the teaching practices of the teachers and learning preferences of the students.

Further analysis of Spearman's rank correlation coefficient and Kendall's Tau rank correlation coefficient revealed that environmental sub-categories had either negative correlation or low correlation between the learning modes preferred by students and offered by teachers. It was observed that students preferred more field trips, more demonstrations and more role playing (teacher/student) than offered by their teachers, whereas students were indifferent to games, simulations and laboratory work.

For the pictorial variable, the students did not seem to favor picture/slide presentation as compared to their teachers. However, for the motion picture/TV sub-category, students and teachers seemed to be in agreement. Neither students nor teachers seem to favor using motion picture/TV as a

learning tool. Students seem to prefer watching closed circuit television as a learning mode; however, their teachers have rarely offered it.

For the symbolic variable, the students prefer maps, charts and diagrams as a learning mode and their teachers have also consistently used maps, charts and diagrams to enhance the students' learning.

Finally, for the verbal category, the students prefer audio recordings in the class independently of teachers' offerings. Teachers also offer audio recordings in the class. Other areas of commonality are discussion (questions posed for students' response in the class), small group work (group projects, case studies and analysis), printed material (text, articles and other reading assignments), and tutorial (teacher individualized instruction in class and office). One area of discrepancy is the lecture (with student note-taking and testing, with little or no discussion). Furthermore the students do not prefer the traditional lecture method of instruction with little or no discussion whereas teachers are eager to offer lectures with little or no discussion in the class.

The results of the study suggest the unwillingness and or the lack of ability of the teachers to meet the needs of students through the offering of those learning modes most often preferred by the students; therefore it is recommended that further research be undertaken to determine the effects on student academic achievement when significant discrepancies exist between the preferred and offered modes of instruction.

The study had limitations because of the teacher's sample size and that t-tests and analysis of variance tables could not be used because the data was on ordinal scale. It is also recommended that another study with

a larger teacher sample size or population be undertaken and that a comparison of the results of that study be made with this one.

SUMMARY

The following table summarizes the areas of commonality, areas of neutrality and the areas of discrepencies in the learning modes preferred by students and those offered by their teachers in the Department of Business at Tuskegee Institute.

Table 17

AREAS OF COMMONALITY, NEUTRALITY AND DISCREPENCIES

A. Areas of Commonality

Students prefer the following learning modes and teachers offer them:

1. Laboratory work (Environmental)
*2. Motion Picture/TV (Pictorial)
3. Maps, charts and diagrams (Symbolic)
4. Audio recordings (in class) Verbal)
5. Discussion (Questions posed for student response in class) (Verbal)
6. Small group work (Group projects, case studies and analysis) (Verbal).
7. Printed materials, text, articles and other reading assignments (Verbal)
8. Tutorial (teacher individualized instruction in class and office) (Verbal)

*The commonality is the low preference by the students and the low offering by the teachers.

B. Areas of Neutrality

Students do favor the following learning modes and teachers do not prefer to offer them:

1. Games and Simulations (Verbal)
2. Pictures/Slides (Pictorial)
3. Closed Circuit Television (Pictorial)
4. Programmed Textual and other Reading Materials which have questions and answers combined (Verbal)

C. Areas of Discrepencies

I. Students prefer the following learning modes whereas the teachers do not offer them:

1. Field Trips (Environmental)
2. Demonstrations (Environmental)
3. Role playing (by Teacher/Students) (Environmental)

II. Students do not prefer the following learning mode whereas teachers offer it:

1. Traditional lecture method (with little or no discussion).

REFERENCES

Douglas, Lloyd, Blanford, James T., Teaching Business Subjects, Prentice Hall, Inc., New York, 1958.

Dubin, Robert, Taneggia, Thomas C., The Teaching-Learning Paradox: A Comparative Study of College Teaching Methods, Center for Advanced Study of Educational Administration, University of Oregon, Eugene, Oregon, 1963.

Good, Carter V., Dictionary of Education, McGraw-Hill Book Company, New York, 1959.

Herrscher, Barton R., "Implementing Individualized Instruction," President, Mitchell College, Statesville, North Carolina (Mimeographed Document, February 1, 1971).

Jones, Larry E., "Fiscal Strategies to Stimulate Instructional Innovation and Change," Journal of Higher Education, Vol. 49, November/December, 1978.

Lindsay, Vaughnie J., "Teacher Education: An Overview," National Business Education Yearbook, No. 10-294-303, 1972.

Ripple, R. E., Notes from a lecture given to the North Alabama Cluster, February, 1979.

Skinner, B. F., The Technology of Teaching, Appleton-Century-Crofts, New York, 1968.

Snellbecker, Glen E., Learning Theory, Instructional Theory and Psychoeducational Design, McGraw-Hill Book Company, New York, 1959.

Webster, A. Merriam, Webster's New Collegiate Dictionary, G & C Merriam Company, Springfield, Massachusetts, 1976.

Wilson, Norman Ward, "Newer Media Education--Problem-Solver or Problem-Maker," Clearing House, Vol. 43, September, 1968-May, 1969.

APPENDIX A

STUDENT QUESTIONNAIRE

TUSKEGEE INSTITUTE STUDENT QUESTIONNAIRE

"An assessment of Modes of Instruction Preferred by Students and Offered by Teachers"

Please indicate your preference as to the following modes of instruction. Circle the number one (1) if you have a very low preference for this mode of instruction. Circle the number five (5) if you have a very high preference for this mode of instruction. If you have not experienced a particular mode of instruction you may circle "DK" for "don't know," although you may state a preference.

MODE	SCALE OF PREFERENCE low high					Don't know
ENVIRONMENTAL						
1. Field trips	1	2	3	4	5	DK
2. Demonstrations	1	2	3	4	5	DK
3. Role playing (by teacher/students)	1	2	3	4	5	DK
4. Games and simulations	1	2	3	4	5	DK
5. Laboratory work	1	2	3	4	5	DK
PICTORAL						
6. Picture/slides	1	2	3	4	5	DK
7. Motion pictures/TV	1	2	3	4	5	DK
8. Closed Circuit Television	1	2	3	4	5	DK
SYMBOLIC						
9. Maps, charts, diagrams	1	2	3	4	5	DK
VERBAL						
10. Audio recordings (in class)	1	2	3	4	5	DK
11. Lecture (with student notetaking and testing, with little or no discussion	1	2	3	4	5	DK
12. Discussion (questions posed for student response in class	1	2	3	4	5	DK
13. Small group work (group projects, case studies and analysis)	1	2	3	4	5	DK
14. Printed materials (Text, articles, and other reading assignments)	1	2	3	4	5	DK

Student Questionnaire (Continued)

MODE	SCALE OF PREFERENCE					
VERBAL (Continued)	low				high	don't know
15. Programmed textual and other reading materials which have questions and answers combined.....	1	2	3	4	5	DK
16. Tutorial (teacher individualized instruction in class and office).....	1	2	3	4	5	DK

17. Other (Please list)

_____

_____

_____

_____

_____

APPENDIX B

FACULTY QUESTIONNAIRE

TUSKEGEE INSTITUTE FACULTY QUESTIONNAIRE

"An assessment of Modes of Instruction Offered by Faculty"

I would like to find out how much use you make of different instructional modes. Please circle the number five (5) if you use that mode of instruction alot; or circle the number one (1) if you use that mode rarely or never.

MODE	SCALE OF USE				
ENVIRONMENTAL	rarely or never used				used alot
1. Field trips.....	1	2	3	4	5
2. Demonstrations.....	1	2	3	4	5
3. Role playing by teacher/students..	1	2	3	4	5
4. Games and simulations.....	1	2	3	4	5
5. Laboratory work.....	1	2	3	4	5
PICTORAL					
6. Pictures/slides.....	1	2	3	4	5
7. Motion pictures/TV.....	1	2	3	4	5
8. Closed Circuit Television.....	1	2	3	4	5
SYMBOLIC					
9. Maps, charts, diagrams.....	1	2	3	4	5
VERBAL					
10. Audio recordings (in class).....	1	2	3	4	5
11. Lecture (with little or no discussion.....	1	2	3	4	5
12. Discussion (questions posed for student response in class).....	1	2	3	4	5
13. Small group work (group projects, cases and research, results shared in class.....	1	2	3	4	5
14. Text, articles and other reading assignments done in class and at home.....	1	2	3	4	5
15. Programmed textual and other reading materials which have questions and answers combined....	1	2	3	4	5
16. Tutorial (teacher individualized instruction in class and office)..	1	2	3	4	5

MODE	SCALE OF USE	
VERBAL (Continued)	rarely or never used	used alot

17. Other (Please list)

_____

_____

_____

_____

_____